Completed Rubric for Exit Project Titled

"The effect of human impact on turbidity levels in the Bronx River"

This project was evaluated using the point scale of 0-1-2-3. The project was evaluated based on the visible information in the project photograph; some more information may have been on the additional sheets.

Summary: This project uses a field investigation to determine if human impact along the Bronx River has an effect on the water's turbidity. The background information supported the question and hypothesis, but could have benefited from additional research about the industrial sites along the Bronx River. The conclusion and scientific explanation supported the claim, but did not accurately reference the data collected during the procedure. A clear data analysis paragraph would have benefited the project and may have led to a more accurate portrayal of the data in the conclusion section. A thorough analysis during the final reflection portion, including identification of additional sources of error and suggested solutions, would have resulted in a stronger conclusion as a whole.

A. Title
Title: The effect of human impact on turbidity levels in the Bronx River
Score: 3 – *The title correctly states the independent variable and the dependent variable and is NOT worded as a QUESTION*
Comments: This title states both the independent variable (human impact) and the dependent variable (turbidity levels) and is not worded as a question.

B. Question
Question: What is the effect of human impact on Turbidity in the Bronx River?
Score: 3 – *The question states the independent variable and the dependent variable, and is testable.*
Comments: This question correctly states the independent and dependent variable. In addition, the dependent variable is testable.

C. Hypothesis
Hypothesis: Our hypothesis is that where there is urban runoffs, there will most likely be turbidity. If we test the waters from certain areas of the Bronx River, then the levels of turbidity from Starlight Park will be greatest because it has the most factories, manufacturing businesses, and residential areas. This causes turbidity because factories can cause urban runoffs.
Score: 2 – *The hypothesis (1) predicts the effect that changing the independent variable will have on the dependent variable, AND (2) explains the reason for the prediction using scientific concepts but it is incomplete or weak.*
Comments: The hypothesis would be improved by a clear connection between urban runoff and "human impact". Otherwise, the reader can make the connection if they have background knowledge on the topic.

D. Background Research (found throughout the project especially within the hypothesis and discussion/conclusion sections)
Score: 3 – *Background research is accurate, containing MANY relevant, well-chosen facts, definitions, concrete details, quotations, scientific concepts, or other information and examples that (1) provide information on the IV & DV; defining them and explaining the relationship between them AND (2) supports the "because" portion of the hypothesis AND(3) attempts to support the "scientific reasoning" of the discussion/conclusion.*
Comments: This section contains a great deal of information about turbidity, its effects on the organisms that live in freshwater, and general human impact on the environment. However, this section could have been strengthened by adding information about the Bronx River and the

specific sites chosen for testing. In addition, more background research about the types of industrial buildings that are located near the River would have been a great asset.

E. Investigation Design (ID)
Score: 2 – *Four of the 5 components of the ID are stated correctly OR more than one IV is chaning at a time or there are not multiple trials.*
Comments: Although Starlight Park was singled out in the hypothesis as having the highest levels of turbidity, the other three locations on the Bronx River are not represented as having lower or higher levels of "human impact". This leaves a weak connection between the IV and the change in IV, relying on the viewer to pull the information out of previous sections. In addition, the DV is not defined in this section.

F. Procedure
Score: 2 – *The Procedure accurately and completely satisfies two or three of the above. (The procedure is (1) a step-by-step description of how the investigation was done AND (2) uses precise language and scientific vocabulary to describe both the sequence of actions taken and materials used AND (3) is sufficiently detailed to enable the reader to replicate the investigation AND (4) is consistent with the Investigation Design Diagram (IDD) and is an appropriate test of the hypothesis.)*
Comments: The procedure is an accurate representation of most of the steps students took, but does not include certain key elements such as: What was the method used to collect water? When was the water collected – during one day or throughout the course of multiple days? When did testing occur – immediately after collection or later? It is unclear whether the trials occurred using different samples of water, or if the same samples were used for multiple tests. It would be difficult to replicate this procedure due to missing key information.

G. Data/Results
Score: 2 – *Most parts of the data graphs and tables are present, complete and accurate. Data analysis is attempted but may not be accurate.*
Comments: The data analysis does not accurately refer to the collected data, resulting in misinformation.

Ha. Discussion/Conclusion: Scientific Explanation
Score: 2 - *Three or four parts of the Scientific Explanation are complete and accurate. A scientific explanation consists of a statement that makes an overall claim addressing the original investigation question AND supports the claim with evidence and relevant, accurate data from the investigation AND contains relevant scientific concepts AND uses words, phrases and clauses that clarify and connect the relationships between claim, evidence and science concepts AND demonstrates an understanding of the topic.*
Comments: The information included in this section attempts to support the claim. Returning to specific scientific concepts addressed in the background research portion of the project would have strengthened it as a whole.

Hb. Discussion/Conclusion: Reflection
Score: 1 – *One part of the Reflection is complete and accurate.*
Comments: The students accurately cited at least one source of error and provided a solution for it. However, there is no reference to the hypothesis and whether it was or was not supported.

I. Literature Cited
Score: 2 – *Most parts of the Literature Cited are complete and accurate. Bibliography is present, but references are not cited in the text of the investigation.*
Comments: The literature used provided important information throughout the project and helped to support student understanding of the topic. Although the literature was cited at key points throughout the investigation, it is cited throughout using only the webpages' addresses. Using standard formatting such as MLA or APA to ensure that each citation includes a title, author, and other important information would have improved this section.

Project Section	Score (0-3)	Weight	Weighted Score
A. Title	**3**	x 1	**= 3**
B. Question	**3**	x 1	**= 3**
C. Hypothesis	**2**	x 2	**= 4**
D. Background Research	**3**	x 2	**= 6**
E. Investigation Design (ID)	**2**	x 2	**= 4**
F. Procedure	**2**	x 2	**= 4**
G. Data/Results	**2**	x 3	**= 6**
Ha. Discussion/Conclusion: Scientific Explanation	**2**	x 2	**= 4**
Hb. Discussion/Conclusion: Reflections	**1**	x 1	**= 1**
I. Literature Cited	**2**	x 2	**= 4**
		Total weighted score	**= 39 (54 max)**
	Final Score (%) =	**=Total weighted score/54 x 100**	**= 72%**